Electronic Version
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Claims

[c1] What is claimed is:

1.An apparatus for improving the acoustic impedance for loudspeaker transducers comprising:

An enclosure with six outer walls and six inner walls connected to form a box structure three of said inner walls being one of three wave-guides forming a closed loop embedded acoustic transmission line;

a second enclosure disposed within said first enclosure using one of the walls of said first enclosure to complete its structure while the other three walls also form the second of the required wave-guides constructing an embedded acoustic transmission line;

a termination member affixed at the end of said transmission line to seal and form the third of the required wave-guides constructing an embedded acoustic transmission line;

at least one aperture located in at least one interior wall preferably the back of said second enclosure of a proportional diameter or area creating a throat/mouth opening to said embedded acoustic transmission line;

an alternative density transmission medium affixed to at least one of said wave guides covering a majority of its

surface;
at least one opening in the wall common to both structures hereinafter called a baffle board to allow mounting at least one bi-directional loudspeaker transducer;
at least one bi-directional radiating loudspeaker mounted on the baffle board;
2. Apparatus, as claimed in claim 1 wherein said interior enclosure is equipped with tuning means to accentuate the low frequencies of the speaker, comprising:
a port means extending through said baffle board or shelf type tuning orifice at said baffle board or,
a port means extending from interior cabinet through any wall of the enclosure or,
a multiple port means extending from said second enclosure through said baffle board or other side wall.

[c2] a passive diaphragm means mounted on said baffle board instead of said port.

[c3] 3. Apparatus, as claimed in claim 1 wherein an acoustic low pass filter is connected in front of the driver to produce low frequencies only, comprising:
A second enclosure placed in front of said driver to provide air mass for acoustic low pass function;
a tubular or shelf port means is used to launch a particular range of low frequencies from said air volume or;
a mechanical passive radiator means is used to launch a

particular range of low frequencies from the new air volume.

[c4] 4. Apparatus, as claimed in claim 1 wherein a horn means is used to couple the driver to the atmospheric pressure, comprising:
a horn type expansion diaphragm means is coupled to the driver in front of the embedded acoustic transmission line to increase its throw or coverage.

[c5] 5. Apparatus, as claimed in claim 1 wherein said driver is of the planar type of flat panel driver that produces sound waves bi-directionally, comprising:
an electrostatic type sound panel for any frequency range or,
a dynamic planar type sound panel for any frequency range or,
a ribbon planar type sound panel for any frequency range or,
any new generic type of bi-directional planar speaker design regardless of type.

[c6] 6. Apparatus, wherein said driver is front mounted directly over and facing said aperture of proper diameter and sealing said embedded acoustic transmission line with said driver, comprising:
a first and second wave-guide disposed directly in front

of and around said driver so mounted at right angles with said center aperture in said second wave-guide and in a radial relationship with said second wave-guide so as to create a channel expanding from the center in a radial manner;

a termination member disposed at the opposite end of the pair of wave-guides disposed to block wave in the embedded acoustic transmission line to cause a reversal of said wave;

an alternate density transmission medium affixed to at least one wall of one of said wave-guides;

a loudspeaker driver of suitable diameter and power handling capability mounted at said mouth of said embedded acoustic transmission line.

[c7] 7. Apparatus, as claimed in claim 6 wherein said aperture has disposed a compression plug mounted directly in front of the said driver to guide wave and increase pressure on said driver to maintain pressure differential with atmosphere;

8. Apparatus, as claimed in claim 6 wherein the reverse side of the driver is coupled to a acoustic low pass filter to produce low frequencies only; comprising

an acoustic low pass filter using an enclosure and a port tube of proper diameter and length; or

an acoustic low pass filter using an enclosure and a shelf

type tuning means created from said enclosure
said acoustic low pass filter is an enclosure and a passive radiator diaphragm of proper diameter and mass.

[c8] 9.Apparatus, as claimed in claim6wherein multiple embedded acoustic transmission lines are used each said enclosure dimension and volume represents a different frequency range to optimize the operation in each range while independent or housed in a common larger enclosure used for the lowest frequencies; comprising:
multiple independent embedded acoustic transmission line enclosures each of a dimension appropriate for the driver representing that frequency range;
multiple different dynamic transducers each of a different diameter appropriate for that frequency range;
A common housing for said multiple embedded acoustic transmission lines to contain said enclosures as a single subwoofer system.

[c9] 10. Apparatus, as claimed in claim 6 when alternate density transmission medium is open cell urethane foam.